

AMENDMENT TO THE SPECIFICATION

Please replace the paragraph beginning on page 9, line 6, with the following paragraph:

The output of the first-stage **601**, $[[Y_1(z)]] \underline{Y_2(z)}$, and the second-stage **602**, $Y_4(z)$, in FIG. 6 are described below in equations 1 and 2.

$$Y_2(z) = \frac{z^{-2}X(z) + (1 - p_1z^{-1})(1 - p_2z^{-1})Q_1(z)}{1 + (B_2 - p_1 - p_2)z^{-1} + (B_1 - B_2p_1 + p_1p_2)z^{-2}} \quad (1)$$

$$Y_4(z) = \frac{z^{-2}X(z) + (1 - p_3z^{-1})(1 - p_4z^{-1})Q_2(z)}{1 + (B_4 - p_3 - p_4)z^{-1} + (B_3 - B_4p_3 + p_3p_4)z^{-2}} \quad (2)$$

where $Q_1(z)$ and $Q_2(z)$ are the additive quantization noise based on a linear model for the quantizers **606**, **609**. In the above relations all variables, including the coefficients, are complex. Parameters B_1 , B_2 , B_3 , and B_4 may be set as desired to achieve various results. In general, parameters B_1 , B_2 , B_3 , and B_4 are set so that the denominators of equations 1 and 2 are equal. In this example, parameters B_1 , B_2 , B_3 , and B_4 are set as shown in equations 3 and 4.

Please replace the paragraph beginning on page 10, line 15, with the following paragraph:

As stated above, $p_1 = 1 + d_1 + jc_1$ and ~~$p_2 = 1 + d_2 + jc_2$~~ , $p_2 = 1 + d_2 + jc_2$. Thus, the noise cancellation transfer function may be expressed as: $NC(z) = NCr(z) + jNCi(z)$ where,

$$\begin{cases} NCr(z) = 1 + (-2 - d_1 - d_2)z^{-1} + (1 + d_1 + d_2 + d_1d_2 - c_1c_2)z^{-2} \\ NCi(z) = -(c_1 + c_2)z^{-1} + (c_1 + c_2 + c_1d_2 + c_2d_1)z^{-2} \end{cases} \quad (11)$$

Please replace the paragraph beginning on page 10, line 19, with the following paragraph:

Therefore, the coefficients c_1 and c_2 used for noise cancellation circuit **611** preferably match with the same coefficients used in the first stage $[[601]]$ **601** of the modulator $[[600]]$ **600**. Any mismatch between may degrade the performance of the system. The real implementation of the complex cascade modulator in accordance with one exemplary embodiment of the invention is shown in Fig. 7 FIG. 7.

Please replace the paragraph beginning on page 10, line 19, with the following paragraph:

Simulation results using Matlab-Simulink have shown that the complex cascaded sigma-delta modulator with complex noise cancellation system, constructed in accordance with FIG. 7 exhibits an excellent noise transfer function (corresponding to an excellent SNR, while at the same time exhibiting excellent immunity to coefficient ~~variation~~ variation).

Please replace the paragraph beginning on page 10, line 19, with the following paragraph:

In one embodiment, sigma-delta modulator **901** may be a complex cascade sigma-delta ADC having a structure and function like that of complex cascade sigma-delta ADC **600**, described above. In another embodiment, sigma-delta modulator **901** may be a complex sigma-delta modulator, such as that shown in FIGS. 4A and 4B, or it ~~[[my]]~~ may be a complex sigma-delta modulator of conventional design, such as those disclosed in US Patent Nos. 6,225,928 or 6,329,939, the disclosures of each of which are incorporated herein by reference.